

IN THE CLAIMS

This is a complete and current listing of the claims, marked with status identifiers in parentheses. The following listing of claims will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A method for visually supporting~~in the case of~~ an electrophysiology catheter application in the heart, ~~whereby comprising:~~

visualizing electroanatomical 3D mapping data, provided during the performance of the catheter application, of an area of the heart to be treated~~are visualized,~~

recording~~characterized in that~~ 3D image data of a body region containing the area to be treated ~~are recorded~~ with a method of tomographical 3D imaging before the catheter application is carried out;

extracting at least significant portions of the area to be treated,~~or significant portions of it, is extracted~~ from the 3D image data, in order to obtain selected 3D image data; and

correlating and visualizing the electroanatomical 3D mapping data and the selected 3D image data ~~are correlated and visualized~~ next to one another in the correct position and dimension.

2. (Currently Amended) The method as claimed in claim 1, ~~characterized in that~~wherein the 3D image data of the body region are recorded with a method of at least one of X-ray computer tomography ~~or of~~and magnetic resonance tomography.

3. (Currently Amended) The method as claimed in claim 1, ~~characterized in that~~wherein the 3D image data of the body region are recorded by ~~means use of~~ a 3D ultrasonic method.

4. (Currently Amended) The method as claimed in ~~one of~~
~~claims 1 to 3,~~

~~characterized~~

~~in that~~claim 1, wherein significant portions of the area to be treated are extracted by segmenting the 3D image data in order to obtain a 3D surface profile of objects in the area which is to be treated.

5. (Currently Amended) The method as claimed in claim 4,
wherein

~~characterized~~

~~in that~~ the correlation in the correct position and dimension is made automatically using surface matching by at least approximately matching the 3D surface profile from the 3D image data to a 3D surface profile from the 3D mapping data.

6. (Currently Amended) The method as claimed in claim 4,
~~characterized in that~~wherein the correlation with the correct position and dimension is effected automatically in a first stage during the performance of the catheter application by ~~means way of~~ at least one of distinct anatomical points ~~or and~~ artificial markers and is refined by the surface matching in a later second stage, in which the 3D surface profile from the 3D image data is at least approximately matched to a 3D surface profile from the 3D mapping data.

7. (Currently Amended) The method as claimed in claim 1,
wherein~~one of claims 1 to 4,~~

~~characterized~~

~~in that~~ the correlation in the correct position and dimension is made manually using a graphical user interface.

8. (Currently Amended) The method as claimed in claim 1,
~~wherein one of claims 1 to 4,~~
~~characterized~~

~~in that~~ the correlation in the correct position and dimension
is made automatically using artificial markers which are
attached to the patient's thorax before the 3D image data are
recorded, and ~~can be identified~~ are identifiable both in the 3D
image data and in the 3D mapping data.

9. (Currently Amended) The method as claimed in claim 1,
~~wherein one of claims 1 to 4,~~
~~characterized~~

~~in that~~ the correlation in the correct position and dimension
is made automatically using distinctive anatomical points
which can be identified_-
both in the 3D image data and in the 3D mapping data.

10. (Currently Amended) The method as claimed in claim 1,
~~wherein one of claims 1 to 9, characterized in that~~ the
selected 3D image data are visualized via a volume rendering
technique.

11. (Currently Amended) The method as claimed in claim 10, _
~~characterized~~
~~in that~~ wherein the selected 3D image data are visualized using
an adjustable volume rendering transfer function.

12. (Currently Amended) The method as claimed in claim 4,
~~wherein one of claims 1 to 9 in combination with claim 4,~~
~~characterized in that~~ the selected 3D image data are
visualized as polygonal grid.

13. (Currently Amended) The method as claimed in claim 1,
~~wherein one of claims 1 to 12,~~
~~characterized~~

~~in that~~ the two visualizations are linked to one another such
that when a user rotates, moves or scales one of the
visualizations the other visualization is simultaneously
subjected to the same rotation, movement or scaling.

14. (Currently Amended) The method as claimed in claim 1,
~~wherein one of claims 1 to 13,~~
~~characterized~~

~~in that~~ registration between the 3D image data and the 3D
mapping data prompts a representation, contained in the 3D
mapping data, of at least some of the catheter to be shown in
the visualization of the selected 3D image data in real time.

15. (Currently Amended) A device ~~for carrying out the method~~
~~as claimed in one of the preceding claims~~, comprising:

- ~~— at least one or more~~ input interfaces ~~(14, 15)~~ for
electroanatomical 3D mapping data and 3D image data_i;
- an extraction module_i ~~(11)~~ ~~which is designed to extract~~
at least significant portions of an area to be treated, ~~or~~
~~significant portions of it,~~ from the 3D image data and
provides selected 3D image data_i;
- a registration module ~~(12)~~, ~~connection connected~~ to the
extraction module ~~(11)~~, ~~which is designed~~ for correlation of
the electroanatomical 3D mapping data and the selected 3D
image data in the correct position and dimension_i; and
- a visualization module ~~(13)~~, connected to the
registration module ~~(12)~~, ~~which provides to provide~~ the 3D
mapping data and the selected 3D image data for visualization
~~such that that they can be shown~~ in the correct position and

dimension, next to one another, using at least one ~~or more~~ display units ~~(6)~~.

16. (Currently Amended) The device as claimed in claim 15, ~~characterized~~
~~in that wherein~~ the registration module ~~(12)~~ includes a graphical user interface, usable ~~(9)~~ ~~which a user can use to~~ make the correlation in the correct position and dimension manually.

17. (Currently Amended) The device as claimed in claim 15, ~~characterized~~
~~in that wherein~~ the registration module ~~(12)~~ is designed for the automatic correlation in the correct position and dimension using artificial markers, ~~which can be identified~~ identifiable both in the 3D image data and in the 3D mapping data.

18. (Currently Amended) The device as claimed in claim 15, wherein
~~characterized~~
~~in that~~ the registration module ~~(12)~~ is designed for the automatic correlation in the correct position and dimension using distinctive anatomical points which ~~can be identified~~ are identifiable both in the 3D image data and in the 3D mapping data.

19. (Currently Amended) The device as claimed in claim 15, ~~characterized~~
~~in that wherein~~ the extraction module ~~(11)~~ is designed to extract the significant portions of the area to be treated by segmenting the 3D image data in order to obtain a 3D surface profile of objects in the area which is to be treated.

20. (Currently Amended) The device as claimed in claim 19, ~~characterized~~

~~in that~~ wherein the registration module (12) is designed for the automatic correlation in the correct position and dimension by surface matching the 3D surface profile from the 3D image data to a 3D surface profile from the 3D mapping data.

21. (Currently Amended) The device as claimed in claim 19, ~~characterized in that~~ wherein the registration module (12) is designed for automatic correlation in the correct position with the correct dimension in a multi-stage process, wherein the correlation in the correct position and the correct dimension is effected by ~~means~~ way of at least one of distinct anatomical points ~~or~~ and artificial markers in a first stage and is refined by surface matching of the 3D surfaced profile from the 3D image data to a 3D surface profile from the 3D mapping data in a later, second stage.

22. (Currently Amended) The device as claimed in ~~one of~~ claims 15 ~~to~~ 21, ~~characterized in that~~ wherein the visualization module (13) is designed for visualizing a part of a catheter used within the representation of the selected 3D image data in real time.

23. (Currently Amended) The device as claimed in ~~one of~~ claims 15 ~~to~~ 22, wherein ~~characterized~~
~~in that~~ the visualization module (13) is designed so that when a user rotates, moves or scales one of
_the visualizations the other visualization is simultaneously subjected to the same rotation, movement or scaling.

24. (New) A method for visually supporting an electrophysiology catheter application in the heart, comprising:

recording 3D image data of a body region containing an area of the heart to be treated with a method of tomographical 3D imaging before electroanatomical 3D mapping data is provide during performance of the catheter application;

extracting at least significant portions of the area to be treated, from the 3D image data, in order to obtain selected 3D image data; and

correlating and displaying the electroanatomical 3D mapping data and the selected 3D image data next to one another in the correct position and dimension.

25. (New) The method as claimed in claim 24, wherein the 3D image data of the body region are recorded with a method of at least one of X-ray computer tomography and magnetic resonance tomography.

26. (New) The method as claimed in claim 24, wherein the 3D image data of the body region are recorded by use of a 3D ultrasonic method.

27. (New) A device for visually supporting an electrophysiology catheter application in the heart, comprising:

means for recording 3D image data of a body region containing an area of the heart to be treated with a method of tomographical 3D imaging before electroanatomical 3D mapping data is provide during performance of the catheter application;

means for extracting at least significant portions of the area to be treated, from the 3D image data, in order to obtain selected 3D image data; and

means for correlating and displaying the electroanatomical 3D mapping data and the selected 3D image data next to one another in the correct position and dimension.

28. (New) The device as claimed in claim 27, wherein the 3D image data of the body region are recorded with at least one of X-ray computer tomography and magnetic resonance tomography.

29. (New) The device as claimed in claim 27, wherein the 3D image data of the body region are recorded by use of a 3D ultrasound.